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VARIATIONS IN TRILLIUM CERNUUM.

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In the basin of Cayuga Lake in Central New York, there is but one known station for *Trillium cernuum*. In aspect the plants from this station seemed to differ considerably from the more familiar material of eastern Massachusetts, and therefore a thorough study of the species was undertaken at the Gray Herbarium. Two fairly well marked tendencies were found, one represented by eastern, the other by western plants, but not sufficiently distinct, however, to be regarded as specific. That these two forms seem to have been vaguely recognized by some other botanists in the past is apparent from the label of a specimen from Lake Superior collected by J. W. Robbins where the following quotation is found: "not rare but the only species seen by me at Lake Superior. Not *T. cernuum* of N. E. That has the peduncle of the flower curved but this is inclined below the leaves but straight."

As is well known[1] the identity of the *T. cernuum* of Linnaeus is in doubt. The description consists of three words only: "flore pedunculato cernuo," which is scarcely sufficient to define the name, as in several species the flowers are more or less nodding or declined. Two citations were given by Linnaeus, one to Colden and the other to Catesby. The habitat given by Linnaeus was "Carolina" referring probably to the Catesby citation. In the Linnaean Herbarium is a specimen collected by Kalm and named *T. cernuum*. Judging from the measurements given by Rendle this is probably the eastern form of *T. cernuum* mentioned above. The Catesby citation has been

[1] Rendle, Journal of Botany xxxix. 332 (1901).

shown by Rendle to apply to *T. Catesbaei* Ell. and judging from Rendle's notes on the Colden citation the latter applies very doubtfully to *T. cernuum*, and more likely to *T. erectum*, as Colden is said to have described the flower as "rubropurpureus." It does not seem possible to settle this uncertainty at present. Meanwhile the name may be employed with its conventional significance.

The western form stands between the *T. cernuum* of the east and *T. declinatum* (Gray) Gleason, but seems to be distinct from the latter species though intergrading more or less with the former. These three plants may be distinguished as follows:

a. Anthers 6–15 mm. long, twice as long as the filaments or more, yellowish white; petals 10–34 mm. broad, 20–50 mm. long; peduncles 3–12 cm. long, straight, horizontal or slightly reflexed; leaves usually not at all petiolate..... *T. declinatum.*

a. Anthers 2.5–6.5 mm. long, one-third longer than the filaments or less, pinkish; petals 5–17 mm. broad, 15–26 mm. long; peduncles 0.5–4 cm. long, recurved or reflexed; leaves usually slightly constricted into an obscurely petiolate base.

b. Petals 5–9 mm. broad (averaging 7.6 mm.), oblong-lanceolate; mature anthers 2.5–4.5 mm. long (averaging 3.8 mm.); peduncles in flower 5–25 (–35) mm. long (averaging 15 mm.)..... *T. cernuum.*

b. Petals 10–17 mm. broad (averaging 13 mm.), oblong-oval or obovate; mature anthers 4–6.5 mm. long (averaging 5.4 mm.); peduncle in flower 12–40 mm. long (averaging 26 mm.), somewhat stouter..... var. *macranthum.*

T. DECLINATUM (A. Gray) Gleason, Bull. Torr. Bot. Club xxxiii. 389 (1906). *T. erectum* var. *declinatum* A. Gray, Man. ed. 5, 523 (1878). *T. cernuum* var. *declinatum* Farwell, Rep. Mich. Acad. Sci. xxi. 363 (1920).—Alluvial bottomlands: central New York to southern Minnesota, Tennessee and Missouri. The eastern limit given by Gleason is Ohio, but the species is frequent near LeRoy, southwest of Rochester, N. Y. and there is a specimen in the Gray Herbarium from Newark, Wayne Co., N. Y., collected by E. L. Hankenson in 1879. As correctly noted by Gleason this plant is related to *T. cernuum* and not to *T. erectum*. Like *T. cernuum* it has a pleasing odor when in flower (Gleason), is an inhabitant of lowland situations, and in proportion of leaf-length to height of plant is like that species. *T. erectum* inhabits wooded slopes, and flowers on the average nearly two weeks earlier than either *T. cernuum* or *T. declinatum*, has a dark purple ovary and generally longer stamens in relation to the length of styles. So far as there is evidence at hand *T. cernuum* is an inhabitant of mucky soil and *T. declinatum* of alluvium. The petals of the three forms under discussion in this paper are usually pure white, but several specimens of *T. declinatum* in the Gray Herbarium are described on the labels as pink or dark red and Farwell notes specimens with deep purple (*T. cernuum* var. *declinatum*

f. *Walpolei* Farwell) or brown purple (f. *Billingtonii* Farwell[1]) petals, filaments, and stigmas at Ypsilanti, Michigan.

T. CERNUUM L. Sp. Pl. 339 (1753).—Low and mucky woodlands and copses chiefly in sandy noncalcareous regions along the coast: Newfoundland to eastern Pennsylvania and Delaware (West Virginia, Millspaugh; Georgia, Small, Britton). It extends inland to Coös County, New Hampshire, and Worcester County, Massachusetts, and is found locally on the sand plains about Albany, New York. A specimen collected by Macoun at Belleville, Ontario, is apparently the typical form though out of range.

Var. **macranthum** var. nov. Petalis ovato-oblongis ovalibus vel plerumque obovatis 10–17 mm. latis; antheris maturitate 4.5–6.5 mm. longis; pedunculis 12–40 mm. longis.—Flowers more showy than in the typical form with broader often obovate petals, larger anthers, longer peduncles and apparently somewhat larger fruit. The peduncles are generally straighter and more often deflexed than recurved, though this is not so marked toward the eastern portion of the range. At the local station the flowers as they grow older increase in size until the petals may reach a maximum width of 21 mm. and a length of 32 mm. The accrescence of the corolla is not so marked in the typical form. This variety inhabits alluvial or mucky soils chiefly in calcareous regions: Vermont, western Massachusetts and southeastern Pennsylvania to Minnesota, Saskatchewan and Mackenzie, chiefly in the vicinity of the Great Lakes. Specimens examined: VERMONT: Rutland, 1896, *W. W. Eggleston;* Fair Haven, 1916, *C. H. Knowlton.* MASSACHUSETTS: Sandstone area, Southwick, Hampden County, 1913, *J. Murdock, Jr. & C. Schweinfurth* (apparently this var.); Amherst, 1869, *G. Mackie,* 1886, *D. W. Rogers.* PENNSYLVANIA: Chester County, 1858–1864, *S. P. Sharples,* transitional. NEW YORK: Round Marshes, Dryden, 1914, *A. J. Eames & L. H. MacDaniels,* no. 2012 (TYPE in Gray Herb.); Lisbon, 1914, *O. P. Phelps,* no. 308 (not typical). MICHIGAN: vicinity of the Michigan Agricultural College, Lansing, 1895, *H. C. Skeels, C. F. Wheeler;* Keweenaw, 1863, *J. W. Robbins,* 1885, *O. A. Farwell,* no. 462. ONTARIO: Casselman, 1891, *Wm. Scott,* 1891, *J. M. Macoun,* no. 13,869, not typical. ILLINOIS: Ringwood, *G. Vasey.* WISCONSIN: Winnebago County, *W. A. Kellerman.* MINNESOTA: Spring Grove, 1902, *C. O. Rosendahl,* no. 269. MANITOBA: 1857, *Bourgeau;* Winnipeg, 1896, *J. M. Macoun,* no. 13,871; Portage la Prairie, 1906, *W. Herriot,* no. 78,379. SASKATCHEWAN: Carleton House, *Hooker dup.* MACKENZIE: Mackenzie River, old specimen. Material seen from the calcareous region of Aroostook County, Maine, was all in fruit. and its exact status could not be determined.

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[1] Rep. Mich. Acad. xxi. 363 (1920).